



# **Arsenic in Rhode Island**

An Update to the Environmental Round Table

on

## **The Legislative Commission on Arsenic**

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# Legislative Commission on Arsenic

- Created by Legislature to evaluate arsenic in soil & standards.
- Members included legislators, housing groups, DEM, DOH, and others.
- Met throughout winter/spring 2007.

# Focus of Commission:

- Fiscal impacts of arsenic remediation on affordability of housing.
- Evaluate/understand naturally occurring arsenic levels in the State - particularly Aquidneck Island levels.
- Understand rationale of current standards.

# DEM's Discussion Points:

- Overview of State Standards  
Risk Based versus Background
- Existing State/Federal Arsenic Standards
- History of R.I. Arsenic Standard & Background Studies
- Current Regulatory Options for Remediation.

# Discussion on Standards:

- R.I. clean up standards (both residential and industrial/commercial standards) for most metals are based on US EPA human health risk calculations.
- The R.I. Arsenic standard is based on state background studies, and is not a risk based standard.

# What does “risk based” mean?

- Risk is the chance or probability of an event occurring (e.g. cancer).
- Risk = Hazard x Exposure
- Hazard is “How toxic is it?”
- Exposure is “How likely is it to happen?”



## Results for Arsenic:

- For arsenic – a calculated risk based standard, using the default parameters for a residential exposure scenario, would be 0.4 ppm.
- The current 7 ppm standard therefore represents an increased risk of about 1 in 50,000.

# Existing State/Federal Arsenic Standards





State	Residential	Industrial/ Non Residential	Basis of Standard	Background
Alabama	<b>0.4</b>	<b>1.6</b>	Risk based screening levels. Site-specific studies allowable.	No statewide background study performed
Arizona	<b>10</b>	<b>10</b>		
Alaska	<b>8 artic zone</b> <b>4.5-5.5</b> <b>40 inch zone</b>		Risk Based	No Background study
California	<b>0.07</b>	<b>0.24</b>	Risk Based Recommend evaluating background	No background study found
Colorado	<b>0.21</b>	<b>0.81</b>	Risk based guidance	No background study I superfund site background 10-14 ppm

Connecticut	<b>10</b>	<b>10</b>	Background	No Background study performed. Background value determined by professional judgment.
Delaware	<b>11 Change in 2005 23</b>			Average 10, 95 % UCL 29 (Based on 19 soil samples and review of 20 sites)
Florida	<b>2.1</b>	<b>12</b>		
Hawaii	<b>20</b>		Background based	Background 20
Illinois	<b>0.4? From compendium, could not confirm by evaluating regs.</b>	<b>3.0? From compendium, could not confirm by evaluating regs.</b>	Could not find standards for arsenic which confirm number listed	Background 11 -13

Iowa	<b>1.4</b> <b>Or site specific background</b>			
Kentucky	<b>0.39 or background</b>	<b>1.6 or background</b>	Risk based, Background (typically employed)	Mean 8.9 Range 0.59-55 95 % UCL 9.4 Site specific mean must be below statewide 95 percentile (21.2), no points above 95 percentile one half of samples must be below 60 percentile (8.3)
Louisiana	<b>12</b>	<b>12</b>		
Maine	<b>10</b>	<b>30</b>	Risked based.	No background study performed
Maryland	<b>2</b>	<b>3.8</b>	Risked Based	
Massachusetts	<b>20</b>	<b>20</b>		3 Background Studies Statewide 139 samples Average 4.8, 95 UCL 24.5 Central Artery Project 754 sample Average 5.3, 95 UCL 21 Boston Area 599 samples Average 5.5 95 UCL 12.9

Region 9 PRGs <u>non cancer</u> endpoint)	22	260	Risk Based (non cancer)	
Region 9 PRGs cancer endpoint)	0.39	1.6	Risk based	
Region 6 PRGs <u>non cancer</u> endpoint	22	280	Risk based (non cancer)	
Region 6 PRGs cancer endpoint	0.39	1.8	Risk based	
Region 3 PRGs	0.43	1.9	Risk based	

# History of R.I. Arsenic Standard & Background Studies



# How Did We Get Here?

- Remediation Regs 1993 – No soil criteria
- Remediation Regs 1996 – Included soil criteria
  - 3 Public work shops
  - 1 Public hearing
  - Many one on one stakeholder meetings
  - Arsenic residential criteria of 1.7 ppm based on geometric average of background study 106 samples
- RIDEM Arsenic workshops 2000 to 2003
- Remediation Regs 2004 – Revised Arsenic Criteria to 7 ppm based on background study using 374 samples (including some of the 106)

# 2001 Background Study

## Statewide:

Thesis evaluated 1,039 total sites  
971 total samples

Final Data Base 125 sites  
374 background samples

**State Average 1.87 ppm**  
**95% UCL 7.1 ppm**

# 2001 Background Study cont.

## Aquidneck Island data

- Total # of samples reviewed = 105
- Total # background samples incl. = 62





# Additional Aquidneck Island data compiled, not included in 2001 study

- 10 Additional sites reviewed
- 398 total background samples
- 97 of 398 samples from Newport
- Average concentration = 4.2 ppm



# **Current Regulatory Options for Remediation**

Rule 12.0 – Special Requirements  
for Managing Arsenic in Soil

2004 revisions included, but not limited to:

## Rule 12.02 Sampling Requirements

- Reduced the minimum # of samples required to determine consistency with background from 20 to 10 samples.

# Rule 12.03 Determining Compliance with the Standard

- Allows 10% of results to exceed standard, up to 15 ppm.
- Allows averaging of results.

# Rule 12.04 Remedial Options for Jurisdictional Arsenic Releases Above 7.0 ppm

- Reduces encapsulation requirements for arsenic between 7 & 15 ppm
- 6" inch soil cap versus 2' feet.
- Permits soil blending to lower levels.

# Rule 12.05 Certification Requirements for Sites Formerly Jurisdictional

- Created simple mechanism for releasing any title restrictions on deed, required under prior regulations.

# Commission Findings:

- General agreement to not change or raise the existing standard of 7 ppm.
- Have DEM & DOH meet with Housing Groups to meet/evaluate more cost effective remedies.
- Bothered by inconsistent sampling/reporting requirements – given prevalence of arsenic.
- Reconvene in fall/winter 2007.

# DEM, DOH, Housing Group Sub-Committee

- Met several times this summer.
- Evaluating pros/cons of applying DOH model for residential lead remediation to arsenic (i.e. reducing cap requirements).
- Evaluating impacts & possible alternatives to the ELUR (as the institutional control mechanism) for homeowners w/ arsenic.
- Evaluating broader outreach options to the public on arsenic – possibly thru the Real Estate disclosure act.



# Next Steps:

- Sub-Committee will report back to Commission this fall.
- Commission will evaluate those recommendations for further consideration.
- Possible Regulatory Changes this winter?
- Possible Statute changes next Spring?

*Questions?*

